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ABSTRACT

The purpose of this study was to investigate the relationships among maternal and neonatal characteristics in two groups of women, those who had participated in childbirth education class (CE) and those who had not, and their newborn children. Two groups of eight mothers and their first born infants, matched on several demographic and medical factors, were observed during a scheduled feeding session 2 to 3 days after birth. Maternal sensitivity and provision of stimulation were rated. Infants' responsivity was rated during feeding and assessed by means of a Brazelton Neonatal Behavioral Assessment Scale. Overall, sensitive mothers tended to have responsive infants. CE mothers did not provide different types or amounts of stimulation to their infants but were rated as more sensitive. Patterns of correlations suggested that the more sensitive rating was a result of these mothers' basing their behavior on the infants' specific behaviors shown during the feeding session, rather than on more global infant characteristics. Four tables present data. (Author/BH)

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# The Relationship Between Childbirth Education and Mother and Infant Characteristics During Feeding

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## Abstract

The purpose of this study was to investigate the relationships among maternal and neonatal characteristics in 2 groups of women, those who had participated in childbirth education class (CE) and those who had not. Two groups of 8 mothers and their first born infants, matched on several demographic and medical factors were observed during a scheduled feeding session 2-3 days after birth. Maternal sensitivity and provision of stimulation were rated. Infants' responsivity was rated during feeding and assessed by means of a Brazelton Neonatal Behavioral Assessment Scale. Overall, sensitive mothers tended to have responsive infants. CE mothers did not provide different types or amounts of stimulation to their infants but were rated as more sensitive. Patterns of correlations suggested that the more sensitive rating was a result of these mothers basing their behavior on the infants specific behaviors shown during the feeding session, rather than on more global infant characteristics.

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# The Relationship Between Childbirth Education and Mother and Infant Characteristics During Feeding[1]

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Findings that a woman's emotional state during pregnancy is linked to the delivery process have encouraged the development of programs designed to promote understanding of childbirth and to enhance the woman's role in that process. Research on the effects of childbirth education has focused on the quality of the delivery process and maternal attitudes, (Doering & Entwisle, 1975; Huttel, Mitchell, Fischer, & Meyer, 1972; Zax, Sameroff, & Farnum, 1975) and the alleviation of pain and anxiety (Klusman, 1975). However, it has been suggested that the childbirth experience may be an important modifier of the mother-infant interaction (Doering & Entwisle, 1975; Duckowny, Note 1) and that an assessment of the quality of this interaction may yield subtle effects of childbirth education programs (Klaus & Kennell, 1976; Zax et al., 1975). The purpose of this preliminary study was to investigate this issue. The three major questions of the investigation were (1) did women who had participated in childbirth education classes differ from women who had not on measures of sensitivity and the provision of stimulation to their infants during feeding, (2) did individual differences in infant responsivity either during the feeding setting or a Brazelton Neonatal Behavioral Assessment correlate with mother characteristics during feeding, and (3) did mothers from the two groups respond to their infant's characteristics differently during feeding.

## Method

### Subjects

The subjects for this preliminary study were two groups of 8 mothers and their first-born infants recruited from the West Virginia University Medical Center. The first group of mothers had attended childbirth education classes offered by the local chapter of the International Childbirth Education Association (ICEA). Infants of the childbirth educated mothers were selected first according to information obtained from the infant's medical record; the second group of mother-infant pairs were in most cases the next one entering the same nursery which met the following criteria. All mothers had a vaginal delivery without general anesthetic and the infants were term, singletons, weighed more than 2500 g. at birth with Apgars of 8 and above at five minutes, and had no diagnosed medical difficulties. Table 1 illustrates that the two groups were comparable in type of delivery, type and amount of medication, type of feeding, and rooming-in arrangement.

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Insert Table 1 about here

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Although approximately 50% of the mothers delivering in the county take the childbirth classes as reported by the local ICEA chapter, most of them do not deliver at the above hospital and therefore an additional 28 mother-infant pairs were assessed in order to obtain the 16 for the study. Their data were not used. There was one major difference between the two groups of women; childbirth educated mothers were significantly older than non-childbirth educated mothers, with a mean age of 25.8 years (range 20-34) as compared to 21.5 years (range 19-25).

Procedure

Assessment of the mothers and their infants took place two to three days after the infant's birth and consisted of the observation of interaction during feeding and a Brazelton Neonatal Behavioral Assessment.

Mother-infant interaction was observed during one scheduled feeding session. A modification of the Osofsky and Danzger (1974) observation scale was used. One of three female observers recorded the frequency of infant and mother behaviors as they occurred. For the mothers, these behaviors included functional and nonfunctional tactile stimulation, auditory and visual stimulation, and the position in which the infant was held. For the infant, responsivity to holding, tactile stimulation, direct and indirect auditory stimulation, and amount of eye contact was recorded. The infant's best and modal responses to auditory stimulation were noted. These behavior frequencies were used to rate the mother and infant after the observation. Interrater reliability for the ratings was assessed during training and at fairly equal intervals throughout data collection; the mean reliability over all ratings was .92 with the lowest value at .60, the other ratings had reliability measures above .80. In all cases the individual who observed the feeding was naive as to the mother's group status.

The Brazelton Neonatal Behavioral Assessment Scale (1973) was given at two to three days after birth to provide an independent assessment of infant responsivity and general behavioral capabilities. It was given by one of four individuals who have been certified as reliable testers by the University of Kansas training center. In almost all cases the person who gave the Brazelton examination had not observed

the interaction.

As a double check for the mothers' group status, they were later asked if they had had childbirth education classes. The data from one mother-infant pair were eliminated due to incorrect information on the medical chart.

## Results and Discussion

Before proceeding to a discussion of the results, it should be noted that due to the small sample size, these results are considered to be trends, which will be further evaluated with additional data collection.

The first question concerns groups differences in measures of maternal sensitivity and attentiveness and provision of stimulation during feeding. Table 2 illustrates the mean ratings for mothers and infants of both groups during feeding.

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Insert Table 2 about here

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Although the women who had the childbirth education classes did not provide different types or amounts of stimulation to their infants during feeding, they were rated as significantly more sensitive and attentive to their infants than mothers who had not had the classes. However, the difference in mean maternal sensitivity was small, 6.63 for the childbirth educated mothers, and 5.63 for the non-childbirth educated mothers, on a 7-point scale.

The mean values for the items on the Brazelton Neonatal Behavioral Assessment Scale are illustrated in Table 3. Infants whose mothers had had the childbirth classes received on the average, higher scores on the hand-to-mouth item on the Brazelton examination.

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Insert Table 3 about here

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Since there were no major differences in behavioral capabilities of the infants in the two groups, the next question to be addressed was whether the individual differences in the infants either during the Brazelton observation or the feeding observation correlated with mother characteristics during feeding, and if mothers from the two groups responded differently to their infants' characteristics. The data over both groups suggests that the infant's responsivity to stimulation during the feeding session was related to mother characteristics during feeding. Mothers whose infants were initially and predominantly more alert exhibited more facial expressiveness and head movement than mothers of less alert infants. Mothers whose infants had more eye contact and were more responsive to direct auditory stimulation talked more to their infants. Also, mothers whose tactile stimulation was characterized by nonfunctional handling tended to have infants who responded well to functional tactile stimulation.

Illustrated in Table 4 are some of the significant correlations among

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Insert Table 4 about here

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infant characteristics during feeding and the Brazelton examination and mother characteristics during feeding. The patterns of correlations for mothers in the two groups suggests that for mothers in the childbirth educated group, behavior toward their infants during feeding was specific to the infant's behavior during feeding whereas in the non-childbirth educated group, mothers' behavior toward their infants was related to the infants' general, global capabilities as assessed by the Brazelton exam. First, for the childbirth educated mothers, several infant behaviors

were related to mother behaviors during feeding The quality of mothers' tactile stimulation was related to scores on several Brazelton items and ratings of infant behavior during feeding. Overall, the tactile stimulation of childbirth educated mothers tended to be characterized by nonfunctional handling when the infants were rated as more irritable on the Brazelton exam. Infants who were more easily consoled when upset and were more able to self-quiet during the Brazelton examination tended to receive less nonfunctional handling from their mothers. These correlations are understandable when it is taken into consideration that observers grouped any tactile stimulation which was not directly functional to the feeding (such as burping, wiping the infant's face, and so forth) as nonfunctional. Also, mothers' tactile stimulation was more characterized by functional handling and less nonfunctional tactile stimulation was given when the infants were more responsive to auditory stimulation. The provision of auditory stimulation during feeding by the childbirth educated mothers was related to the infant's responsivity to auditory stimulation. The more responsive the infant was to direct auditory stimulation, the more the mother talked to her infant. Furthermore, mothers whose infants were more responsive to indirect auditory stimulation were characterized by more facial expressiveness and head movements.

The patterns of correlations for the nonchildbirth educated mothers suggests that these mothers may have been responding to their infant's behaviors on a general level rather than to the specific behaviors exhibited during feeding. As can be seen in Table 4, infant's responsivity to visual and auditory stimulation as assessed by the Brazelton orientation items was positively related to mother's rating of sensitivity and

attentiveness and frequency of auditory stimulation during feeding. Also, mothers whose infants were more responsive to inanimate visual stimulation tended to hold their infants closer than mothers whose infants were not as responsive. Increased frequency of functional handling during feeding was related to higher scores on motor maturity on the Brazelton examinations as well. The only infant behavior during feeding which was significantly related to a mother behavior during feeding was the infant's response to holding. Mothers whose infants responded to holding by turning toward the mother's body, with head movements, and so forth, tended to provide auditory stimulation which was more verbal in quality than mothers whose infants did not respond as well to holding.

In sum, the above patterns of correlations suggest that mothers who have attended the childbirth education classes may have been rated as more sensitive and attentive to their infants during feeding because they based their behavior on the infant's specific behaviors during the feeding session rather than on the infant's general global abilities as did the mothers in the non-childbirth educated group.

## Footnotes

1. A shorter version of this paper was presented at the biennial meeting of the Society for Research in Child Development, San Francisco, March, 1979.

2. The authors would like to express their gratitude to the obstetric, pediatric, and nursing staff at the West Virginia University Medical Center particularly William G. Klingberg, M.D., Charles A. White, M.D., and June Merrill, R.N., for their cooperation in this project and Bonnie Kwiatkowski, M.A., Gale Richardson, B.A., and Barbara P. Trout, B.A., for their invaluable assistance in data collection.

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Table 1

Subject Characteristics

| Mothers Characteristics | Childbirth Educated (N=8) | Non-childbirth Educated (N=8) |
|---|---|---|
| Age | 25.8 years (20-34) | 21.5 years (19-25) |
| Education | 14.5 years (N=7) | 14.2 years (N=4) |
| Type of Labor | Spontaneous - 7<br>Induced - 1 | Spontaneous - 7<br>Induced - 1 |
| Medications | Nisentil - 5 (30-75mg)<br>Seconal - 1 (100 mg) | Nisentil - 4 (30-90mg) |
| Anesthetic | Pudendal - 2<br>Epidural - 1<br>Local - 3<br>Spinal - 1 | Pudendal - 2<br>Epidural - 3 |
| Use of forceps | Low - 4 | Low - 2<br>Med - 2 |
| Type of feeding | Breast - 7<br>Bottle - 1 | Breast - 6<br>Bottle - 2 |
| Rooming-in arrangement | Rooming-in - 6 | Rooming-in - 5 |
| **Infant Characteristics** | | |
| Sex | M-5, F-3 | M-3, F-5 |
| Birthweight | 3399.5 g. | 3199.6 g. |
| Apgars - 1 min. | 8.13 | 7.88 |
| Apgars - 5 min. | 9.50 | 8.88 |

Table 2

Means and Standard Deviations of Mother

and Infant Characteristics During Feeding

| Variable | Childbirth Education Mothers | | Non-Childbirth Education Mothers | |
|---|---|---|---|---|
| **Mother Characteristic** | | | | |
| Attentiveness, sensitivity* | 6.63 | .52 | 5.63 | 1.06 |
| Frequency of auditory stimulation | 5.63 | 2.26 | 5.63 | 2.13 |
| Frequency of eye contact | 5.63 | .74 | 5.75 | .46 |
| Quality of auditory stimulation | 6.00 | 1.60 | 5.63 | 2.13 |
| Head and facial movement | 6.00 | .53 | 6.00 | 1.20 |
| Quality of tactile stimulation | 6.38 | .74 | 6.00 | 1.07 |
| Quantity of nonfunctional tactile stimulation | 5.50 | 2.0 | 4.38 | 2.00 |
| Quantity of functional tactile stimulation | 5.25 | 1.39 | 5.88 | 1.13 |
| Position of baby | 6.25 | 1.75 | 6.13 | 1.26 |
| **Infant Characteristic** | | | | |
| Initial state | 4.00 | 1.40 | 3.88 | 1.73 |
| Predominant state (1) | 3.13 | .35 | 3.50 | 1.41 |
| Predominant state (2) | 4.40 | .55 | 3.67 | 1.75 |
| Eye contact best | 5.38 | 3.00 | 4.00 | 1.93 |
| Eye contact modal | 1.63 | .74 | 2.00 | 1.41 |
| Best direct auditory responsivity | 2.75 | 1.67 | 3.13 | 2.23 |
| Modal direct auditory responsivity | 1.63 | 1.06 | 2.00 | 1.41 |
| Best indirect auditory responsivity | 1.86 | 1.21 | 2.38 | 1.51 |
| Modal indirect auditory responsivity | 1.21 | .49 | 1.88 | 1.25 |
| Response to holding | 4.75 | .46 | 5.00 | 1.07 |
| Responsivity to functional tactile stimulation | 3.25 | 2.05 | 2.25 | 1.91 |
| Responsivity to nonfunctional tactile stimulation | 1.63 | 2.00 | 1.13 | 1.25 |

* $p < .05$

Table 3

Means and Standard Deviations of Brazelton Measures

| Variable | | Mean | S.D. | Mean | S.D. |
|---|---|---|---|---|---|
| Initial state | | 2.38 | .92 | 3.25 | 1.58 |
| Predominant state (1) | | 3.38 | .74 | 3.75 | .74 |
| Predominant state (2) | | 5.13 | .99 | 5.89 | .35 |
| Response decrement: | Light | 5.50 | 1.91 | 6.00 | 1.15 |
| | Rattle | 6.75 | 1.50 | 6.00 | 1.15 |
| | Bell | 6.67 | 2.52 | 6.75 | 1.25 |
| | Pinprick | 4.00 | 0 | 3.50 | .71 |
| Orientation: | Inanimate visual | 4.88 | 1.46 | 5.00 | 1.91 |
| | Inanimate auditory | 5.88 | 1.25 | 5.57 | 1.51 |
| | Inanimate auditory/visual | 6.63 | 1.60 | 5.71 | 1.38 |
| | Animate visual | 4.50 | 1.20 | 4.29 | 2.14 |
| | Animate auditory | 4.71 | 1.98 | 4.71 | .76 |
| | Animate visual/auditory | 5.00 | 1.51 | 4.86 | 1.68 |
| Alertness | | 4.88 | 1.73 | 4.75 | 1.76 |
| Tone | | 5.25 | 1.16 | 5.75 | .89 |
| Motor maturity | | 4.13 | .35 | 4.38 | .92 |
| Pull to sit | | 2.88 | 1.55 | 4.25 | 2.24 |
| Cuddliness | | 4.88 | 1.46 | 5.63 | .74 |
| Defensive movements | | 4.25 | 2.25 | 5.86 | 2.48 |
| Consolability | | 7.75 | 2.19 | 6.13 | 1.81 |
| Peak of excitement | | 6.38 | 1.19 | 6.75 | 1.16 |
| Rapidity of buildup | | 4.75 | 2.05 | 4.25 | 1.67 |
| Irritability | | 3.75 | 1.83 | 4.57 | 2.07 |
| Activity | | 4.88 | .83 | 5.00 | 1.01 |
| Tremulousness | | 4.00 | 2.83 | 3.50 | 2.51 |
| Startle | | 3.88 | 1.96 | 2.50 | 1.20 |
| Lability of states | | 2.13 | .99 | 2.75 | 1.16 |
| Self quieting | | 4.00 | 2.08 | 2.63 | 2.83 |
| Hand to mouth* | | 6.13 | 1.46 | 3.75 | 2.87 |

* $p < .05$

Table 4

Relationships Between Infant and Mother Characteristics (Partial Summary)

Childbirth Education Group

| Mother Rating | Brazelton Measure | |
|---|---|---|
| Quality of Tactile stimulation | Irritability | .81* |
| | Peak of excitement | .78* |
| | Consolability | -.81* |
| | Self quieting | -.81* |
| Frequency of auditory stimulation | Startle | -.79* |
| Quality of auditory stimulation | Startle | -.81* |
| Frequency of eye contact | Startle | -.82* |

| Mother Rating | Infant Rating | |
|---|---|---|
| Frequency of nonfunctional tactile stimulation | Best response to direct auditory stimulation | -.78* |
| | Modal response to direct auditory stimulation | -.77* |
| | Best response to indirect auditory stimulation | -.91* |
| | Modal response to indirect auditory stimulation | -.92* |
| Quality of tactile stimulation | Modal response to direct auditory stimulation | -.70* |
| Frequency of auditory stimulation | Best response to direct auditory stimulation | .62* |
| Quality of auditory stimulation | Best response to direct auditory stimulation | .69* |
| Frequency of head and facial movement | Predominant state | .76* |
| | Best response to indirect auditory stimulation | -.78* |

Non-childbirth Education Group

| Mother Rating | Brazelton Measure | |
|---|---|---|
| Sensitivity | Orientation: | |
| | Inanimate visual | .30* |
| | Animate visual/ auditory | .63* |
| | Inanimate visual/ auditory | .35* |
| Position | Animate auditory | .76* |
| Frequency of auditory stimulation | Inanimate visual/ auditory | .80* |
| Frequency of functional handling | Motor maturity | |

| Mother Rating | Infant Rating | |
|---|---|---|
| Quality of auditory stimulation | Responsivity to holding | .75* |

* p .05 ** p



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